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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/636,246	08/10/2000	SHUMIN WANG	98124X205843	6397
29050	7590	12/01/2003	EXAMINER	
PHYLLIS T. TURNER-BRIM, ESQ., LAW DEPARTMENT CABOT MICROELECTRONICS CORPORATION 870 NORTH COMMONS DRIVE AURORA, IL 60504			CHEN, KIN CHAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/636,246

Applicant(s)

WANG ET AL.

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 11-31, 36-44 and 47-67 is/are pending in the application.
- 4a) Of the above claim(s) 2, 5, 6, 20, 21, 23, 25, 41, 43, 47, 48, 50 and 52-67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 11-19, 22, 24, 26-31, 36-40, 42, 44, 49 and 51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3,4, 11-19, 22, 24, 26-31, 36-40, 42,44, 49, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schutz (US 6,136,714) in view of Watts et al. (US 5,897,375; hereinafter "Watts") or Kaufman et al. (US 5,954,997; hereinafter "Kaufman").

Schutz teaches a system for polishing one or more layers of a multi-layer substrate that includes a first metal layer and a second layer. The system may comprise a liquid carrier, one polishing additive that increases rate at which the system polishes at least one layer of the substrate (such as tartaric acid), one stopping compound such as polyethylenimine. The system may comprise abrasive such as alumina or silica (col. 3, lines 41-43; col. 4, lines 5-50). Schutz teaches that the "chelators" (so-called polishing additive or stopping compound in the instantly claimed invention) may be used, see col. 4, line 41. Hence, it would have been obvious to one with ordinary skilled in the art to use the combination of tartaric acid and polyethylenimine. Furthermore, because each of which is

taught by Schutz to be useful for the same purpose for polishing metal and enhance the metal removing.

" It is prima facie obvious to use two compositions each of which is taught by the prior art to be useful for the same purpose. " In re Kerkhoven 205 USPQ 1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

The examiner notes that applicant intends to use two different interpretations to distinguish between polishing additive and stopping compound and states that polishing additive is to increase the rate of polishing and stopping compound is to partially inhibit the removing of the second layer and therefore increase the polishing selectivity of the metal to the second layer. However, given their broadest reasonable interpretation consistent with the specification, the stopping compound (enhancing the polishing selectivity) is **relatively** metal removal-enhancing as Schutz disclosed. In addition, the same materials are used with the same process, it appears that said chelators (polyethylenimine and tartaric acid) of Schutz would inherently contain the same properties and functions as claimed.

Unlike the claimed invention, Schutz does not teach that the system comprises at least one oxidizing agent nor does Schutz teach further comprising at least one passivation film forming agent comprising one or more 5-6 member heterocyclic nitrogen-containing rings (such as benzotriazole). However, hydrogen peroxide and benzotriazole are commonly used in the metal polishing to ensure rapid oxidation of the metal layer and form a protective film on metal

while balancing the mechanical and chemical polishing components of the slurry. Watt (col. 2, lines 30-36) or Kaufman (col. 4, lines 14-17) is relied on to show that hydrogen peroxide and benzotriazole are used in the slurry for CMP polishing for metal. Hence, it would have been obvious to one with ordinary skill in the art to use hydrogen peroxide and benzotriazole in the system of Schutz in order to ensure rapid oxidation of the metal layer and form a protective film on metal while balancing the mechanical and chemical polishing components of the slurry.

Claims 1 and 36 differ from the combined prior art by specifying stopping compound with a polishing selectivity of the first metal layer : second layer of at least about 30:1. However, the same materials are used in the same process, it appears that the material would inherently contain the same properties and functions as claimed.

As to dependent claims 11 and 12, Schutz teaches the concentration encompassing the range cited (col. 4, lines 47-49).

The limitations of dependent claims 3,4, 11-19, 24, 26, 28-31, 37-40,44, and 49 have been addressed above and rejected for the same reasons, *supra*.

Dependent claim 27 differs from prior art by specifying well-known feature (such as polymeric additives, polyvinyl alcohol) to the art of composition for polishing. A person having ordinary skill in the art would have found it obvious to modify the combined prior art by adding same well-known feature to same in order to provide their art recognized advantages and produce an expected result.

As to dependent claims 22, 42, and 51, Schutz teaches the stopping compound such as polyethylenimine. Schutz is not particular about the

molecular weight of the compound, therefore, it would have been obvious to one with ordinary skill in the art to use a suitable molecular weight in order to provide their art recognized advantages and produce an expected result.

It is noted that applicant did not traverse the aforementioned conventionality (e.g., well-known features, obviousness), which have been stated in the office action (June 2003).

Response to Arguments

3. Applicant's arguments filed September 29, 2003 have been fully considered but they are not persuasive.

Applicant has argued that Schutz does not disclose or suggest a polishing slurry comprising two or more chelating agents. It is not persuasive. As has been stated in the office action, Schutz teaches that the "chelators" (so-called polishing additive or stopping compound in the instantly claimed invention) may be used, see col. 4, line 41. Hence, it would have been obvious to one with ordinary skill in the art to use the combination of tartaric acid and polyethylenimine.

Furthermore, because each of which is taught by Schutz to be useful for the same purpose for polishing metal and enhance the metal removing.

" It is prima facie obvious to use two compositions each of which is taught by the prior art to be useful for the same purpose. " In re Kerkhoven 205 USPQ 1069 (CCPA 1980). In re Susi 169 USPQ 423, 426 (CCPA 1971). See also Ex parte Quadranti 25 USPQ 2d 1071 (BPAI 1992).

Applicant has argued that Schutz has the exhaustive list of suitable chelating agents provided. In fact, in applicant's specification, applicant has long list of polishing additives and stopping compounds (from page 5 through page 9).

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (703) 305-2667. The fax phone number for the organization where this

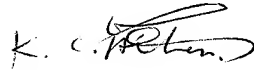
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application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.

November 21, 2003

A handwritten signature in black ink, appearing to read 'K. C. Chen', with a stylized flourish at the end.

**KIN-CHAN CHEN
PRIMARY EXAMINER**